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# PLASTIC HOT DIP PACKAGING

1210-C-2

Contract No. RD-88
Task Order No. 2

Project Engineer - [redacted] 25X1

Technician [redacted] 25X1



October 28, 1955



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The scope of the hot-dip program is to determine the feasibility of coating the following units with a plastic of high melting point, which is durable, which is impervious to water and which will withstand the action of salts that may be found in the earth.

1) R.R. Signal Device
2) Plastic Explosives C-3 and C-4
3) Primacord and Black Powder Time Fuze
4) Pull-Type Fuze Lighters
5) Pocket Incendiary Units
6) Thermit Well Units
7) Rocket Incendiary Adapters, 2.36" and 3.50"
8) Mark I and/or Mark II Pencil Units
9) AC Delay Packages
10) Fuzee Matches

The material under consideration can also be subjected to low temperature without becoming brittle. The major problem encountered thus far in the hot-dip program is that caused by the expansion of the air within the package during the dip and shortly thereafter. The air being subjected to the high temperatures expands and forms large bubbles in the plastic coating. This results in weak plastic films at those points, and in many instances there is actual rupture of the plastic.

Attempts to prevent the escape of the air have been made. These have included the use of aluminum foil wrappers, scrim bags and rubber latex. Of these the latex seems to be the only one which could be used. Even with it, there are difficulties. One will have to determine the proper viscosity so that all the apertures will be filled without allowing too much to enter the package. Several types of coagulants were tested, and it was found that each had an effect upon film strength. The possibility of using wax as a preliminary coat was also checked; however, the highest melting wax found, approximately 285°F, had too low a melting point for the temperature of the hot-dip bath, 325°F. The possibility of preheating the package can be ruled out because of the time that a package must be kept at the elevated temperatures to obtain a uniform temperature. At these temperatures some of the units would be rendered useless. Cooling the unit naturally aggravates the expansion problem without causing the plastic to set rapidly enough to entrain the air.

Tests to determine the heat sensitivity of the materials have also been conducted. It has been found that only the M-34 Detonator and the primacord are sufficiently heat sensitive to cause difficulty.

The latter can burn at 275°F; the former becomes useless after long term exposure to 325°F. During the dip process it is doubtful that any of the units will reach these temperatures.

The units which can be hot-dipped as shipped are:

P-Unit
Fuzee Matches in tear strip cans
Rocket Incendiary Adapters, 2.36" and 3.50"

does polyethylene melt?

Future Work for Period October 1 to December 31, 1955

To investigate further the materials which could provide a satisfactory preliminary coat and to prepare units for live dipping in hot plastic at the demolition site. Once this problem has been solved, the remaining problems are essentially ones of detail, and no difficulty is anticipated in solving them.